

4. Basic Components

- 1) Cutting section
- 2) Spindle section
- 3) Cutting section
- 4) Microscope section
- 5) Operation panel and CRT display

5. Basic Specifications

5-1 Cutting section

- 1) Applicable wafer size : $\phi 3'' - \phi 6''$
Max. 152.4mm (6'')
- 2) X-axis (chuck table horizontal movement)
 - Effective cutting stroke : 220mm max.
 - Cutting range : Circle : 0.01 - 160.00mm
Square : 0.01 - 220.00mm
 - Stroke step : $1\mu\text{m}$
 - Wafer cutting speed : 0.3 to 300mm/s
 - Return speed : 300mm/s
 - Control method : Open loop
- 3) Y-axis (spindle forward-rearward movement)
 - Spindle forward-rearward stroke : 160mm max.
 - Index setting range : 0.0001 to 160.0000mm
 - Minimum step : $0.2\mu\text{m}$
 - Index speed : 66mm/s
 - Control method : Open loop
- 4) Z-axis (spindle vertical movement)
 - Spindle vertical stroke : 33mm
 - Remaining cut range : 0.0001 to 33.0000mm
 - Minimum step : $0.1\mu\text{m}$
 - Cutting feed speed : 30mm/s
 - Spindle escape amount : 0.0001 to 33.0000mm
 - Control method : Open loop

5) θ -axis (chuck table rotary movement)

Rotation range	: 380° maximum (-100° to +280°)
Minimum index (set value)	: 0.01°
θ orientation (minimum step)	: 0.0005493°
Rotating speed	: 180°/sec
Control method	: Fully closed loop

5-2 Spindle motor

1) Rotating speed	: Constantly 30,000min ⁻¹ (rpm) (Variable range 3,000 to 40,000min ⁻¹ (rpm)) (High frequency air spindle)(Water cooling method)
2) Output	: 1.5kW S type at 30,000min ⁻¹ (rpm)

5-3 Alignment microscope

: TV monitor (9", overall magnification: 230X) Dual objective microscope (objective lens: 10X, span: 40 mm) CCD camera incorporated Any of the monocular lenses (10X, 15X, 20X) supplied as special accessories can be installed.
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5-4 Protective functions

- 1) Air pressure (from the source) sensor
- 2) Spindle overheated sensor

6. Accuracy

1) Chuck table upper surface parallelism	: 5 μ m/150mm diameter (on lower disk)
2) Y-axis indexing accuracy	: Single pitch error 3 μ m Cumulative pitch error 5 μ m/160mm
3) Straightness	: X-axis pitching 3 μ m/210mm yaw 3 μ m/210mm Y-axis pitching 3 μ m/160mm yaw 3 μ m/160mm
4) X- and Y-axes right angle accuracy	: 5 μ m/150mm
5) Z-axis calculation repeat accuracy	: 1 μ m/5mm

7. Utilities

7-1 Power Requirements

- 1) Input voltage : 3phase 200VAC \pm 10% or less 50/60Hz
- 2) Power consumption : 2.5kVA
- 3) Noise : Please avoid noise equivalent to 2,000V or more at a pulse width of 500 ns (square wave).
- 4) Grounding : Inter-ground resistance : JIS Class 3, 100 Ω max.

7-2 Air

- 1) Pressure : 0.49MPa-G(5.0kgf/cm²-G) or more
0.78MPa-G(8.0kgf/cm²-G) or less
Fluctuation range should be within 0.029MPa-G (0.3kgf/cm²-G)
- 2) Flow rate : 200N ℓ /min (including flow rate for vacuum generated air-blow 150N ℓ /min)
- 3) Nominal filtration rating : 0.01 μ m or less
- 4) Solid removal : 99.9999% or more
- 5) Oil removal : 0.1PPM wt/wt (at 30°C)
- 6) Atmospheric dew point : -15°C or less

(In order to conduct stable high accuracy cutting, an RD type temperature controllable air dryer is prepared as a special accessory.)

7-3 Water used

- 1) Deionized water
 - Pressure : 0.2 to 0.39MPa(2 to 4kgf/cm²) \pm 10%
 - Flow rate : 5.0 ℓ /min max.
 - Water temperature : Room temperature +2°C
Fluctuation range within \pm 1°C
- 2) Spindle coolant
 - Pressure : 0.2 to 0.39MPa(2 to 4kgf/cm²) \pm 10%
 - Flow rate : 2.5 ℓ /min min.
 - Water temperature : Within room temperature \pm 0.5°C

7-4 Water drainage

- 1) Connection port : Duct hose nominal size : 32mm

7-5 Duct

- Capacity : 2.5m³/min or large and 5m³/min or less

7-6 Main dimensions

- Main body : 760(W) \times 850(D) \times 1510(H)mm
(without protrusions)